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POLICY ALTERNATIVES FOR THE CENTRAL BANK OF THE DOMINICAN REPUBLIC

by

Philip L. Brock
Department of Economics
Duke University
Durham, N.C. 27706

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Agricultural Finance Program
Department of Agricultural Economics
and
Rural Sociology
The Ohio State University
2120 Fyffe Road
Columbus, Ohio 43210

Philip L. Brock
Department of Economics
Duke University
Durham, N.C. 27706

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Policy Alternatives for the Central Bank of the Dominican Republic

At present, the policy options of the Central Bank are limited by the necessity of financing the fiscal deficit of the central government. Although the exact magnitude of the fiscal deficit for 1989 is not known with certainty, there are several estimates that place the deficit within the range of 3 to 6 percent of gross domestic product. In this paper, I will attempt to examine the alternatives facing the Central Bank in financing the deficit. Some familiarity with my accompanying paper, "Central Bank Policy and Macroeconomic Adjustment in a Commodity-Exporting Economy", will be helpful in reading this paper.

1. Financing the Fiscal Deficit

To finance the fiscal deficit, the Central Bank must rely primarily on the inflation tax. The inflation tax has three components whose size is determined by the inflation rate, the reserve ratio on demand deposits, and the reserve ratio on time deposits. Over the long run, the tax on currency is equal to the nominal interest rate ($\pi + r$) times the stock of currency (c): $c(\pi + r)$. The tax on demand deposits is equal to the reserve ratio on demand deposits (τ) times the nominal interest rate times the amount of demand deposits: $\tau d(\pi + r)$. And the tax on time deposits is equal to the reserve ratio on time deposits (γ) times the nominal interest rate times the amount of time deposits (t): $\gamma t(\pi + r)$. The accompanying paper ("Central Bank Policy and Macreconomic Adjustment in a Commodity-Exporting Economy")

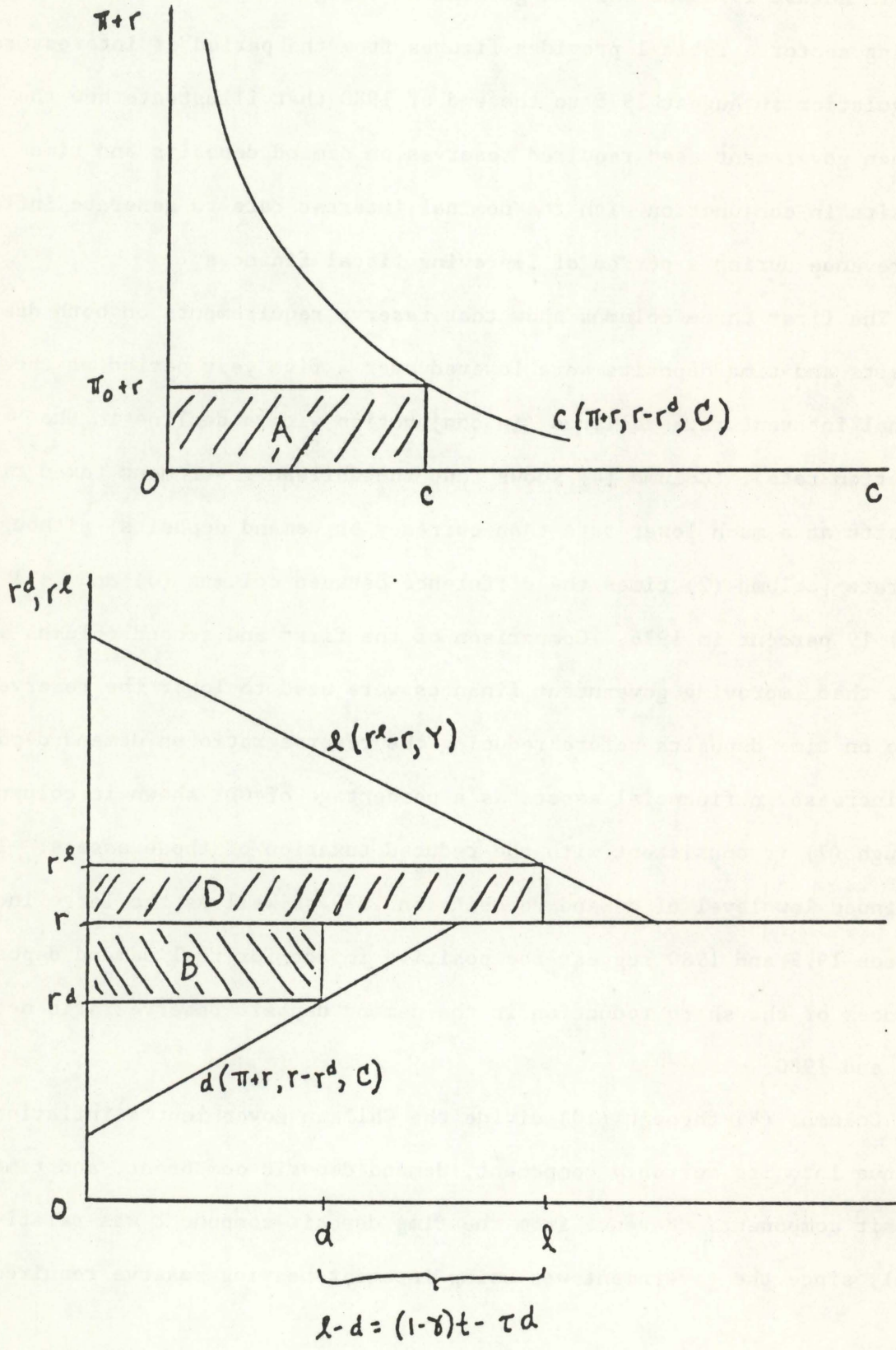
shows that revenue from the inflation tax can be expressed alternatively as follows, where r^d is the real interest rate paid on demand deposits, r^ℓ is the real interest rate charged on bank loans, and ℓ is the quantity of bank loans:

$$R = (\pi + r)c + (r - r^d)d + (r^\ell - r)\ell \quad . \tag{1}$$

Figure 1 illustrates the three components of the inflation tax. Shaded area A is the tax on currency, shaded area B is the tax on demand deposits, and shaded area D is the tax on loans. Time deposits cannot be taxed as easily as demand deposits or loans because time deposits are held as a store of wealth. Consequently, banks must pay a competitive rate of return on time deposits, thereby shifting the reserve tax on time deposits to borrowers from the banks.

Since the Central Bank has never previously faced the prospect of financing such large fiscal deficits, it may be instructive to examine the manner by which the Chilean Central Bank collected inflation tax revenue during the period 1975 - 1980. In 1975 the Chilean government was running a large fiscal deficit that had worsened as a result of a halving of international copper prices. Lack of access to international credit markets dictated a heavy reliance on the inflation tax, so that during the first half of 1975 the inflation rate accelerated to an annual rate of over 600 percent. In mid-1975 the government undertook major cuts in expenditures that slowed the inflation rate to an annual level of under 200 percent during the second half of the year. Even with the cuts in fiscal expenditure, the Central Bank was forced in 1975 to intervene in the Savings and Loan System (SINAP). The resulting expansion of domestic credit during the next three years to finance the intervention was one of the principal

Figure 1. The Components of Revenue from the Inflation Tax



causes for the large size of the inflation tax imposed by the Central Bank during these years.

In August 1975 the Chilean government deregulated interest rates in the banking sector. Table 1 provides figures from the period of interest rate deregulation in August 1975 to the end of 1980 that illustrate how the Chilean government used required reserves on demand deposits and time deposits in conjunction with the nominal interest rate to generate inflation tax revenue during a period of improving fiscal finances.

The first three columns show that reserve requirements on both demand deposits and time deposits were lowered over a five year period as the nominal interest rate declined (in conjunction with a decline in the inflation rate). Column (4) shows that the Chilean government taxed time deposits at a much lower rate than currency or demand deposits, although the tax rate [column (2) times the difference between columns (3) and (4)] was still 19 percent in 1976. Comparison of the first and second columns also shows that improving government finances were used to lower the reserve ratio on time deposits before reducing the reserve ratio on demand deposits. The increase in financial assets as a percentage of GDP shown in columns (5) through (7) is consistent with the reduced taxation of those assets. The continued low level of demand deposits in 1979 as well as the large increase between 1979 and 1980 suggest the positive impact for real demand deposit balances of the sharp reduction in the demand deposit reserve ratio between 1979 and 1980.

Columns (8) through (10) divide the Chilean government's inflation tax revenue into its currency component, demand deposit component, and time deposit component. Revenue from the time deposit component was relatively small, since the government was using interest-bearing reserve requirements

Table 1: Inflation Tax Revenue in Chile: 1975-1980
(All Figures are in Percentage Terms)

	Legal Reserve Ratio on Demand Deposits (1)	Legal Reserve Ratio on Time Deposits (2)	Short-Term (30-day) Nominal Interest Rate (3)	Interest Paid on Time Deposit Reserves[2] (4)	Currency / GDP (5)	Demand Deposits / GDP (6)	Time Deposits / GDP (7)
1975[1]	80	82	234	195	1.73	2.12	2.09
1976	83	58	198	166	1.54	1.99	3.54
1977	70	36	100	85	1.97	2.35	5.88
1978	47	20	64	58	2.30	2.47	7.26
1979	42	15	46	30	2.34	2.27	9.08
1980	16	4	39	0	2.38	3.08	10.60

(Inflation Tax Revenue)/GDP

	Currency Component (col. 3)(col. 5) (8)	Demand Deposit Component (col. 1)(col. 3)(col. 6) (9)	Time Deposit Component (col. 3-col. 4)(col. 2)(col. 7) (10)	Total (11)
1975	4.05	3.97	0.67	8.7
1976	3.05	3.27	0.66	7.0
1977	1.97	1.65	0.32	3.9
1978	1.47	0.74	0.09	2.3
1979	1.08	0.44	0.22	1.7
1980	0.93	0.19	0.17	1.3

Source: Columns (1)-(4) are taken from various issues of the Banco Central de Chile, Boletín Mensual. Columns (5)-(7) are taken from various issues of the International Monetary Fund, International Financial Statistics, using mid-year data for currency, demand deposits, and time deposits.

[1]Figures are for August-December (annualized).

[2]The Central Bank stopped paying interest on time deposit reserves in September 1979.

on time deposits to provide deficit financing. During the first two years revenue from the inflation tax on currency and demand deposits was about equal in magnitude, while during the last four years tax revenue from demand deposits was gradually reduced relative to tax revenue from currency. During the period from 1975 to 1980 inflation tax revenue was lowered from 8.7 percent ofGDP to 1.3 percent of GDP.

The 1988 Increase in Reserve Requirements in the Dominican Republic

In 1988 the Central Bank of the Dominican Republic substantially raised the effective reserve ratio on bank deposits. Table 2 shows figures in real terms of the changes in bank loans, bank reserves, demand deposits, and time deposits for the banking system. The figures show that bank reserves rose substantially at the same time that bank loans, demand deposits, and time deposits all fell in real terms.

Table 2

The Consequences of Raising Reserve Requirements

in the Dominican Republic

Year	Bank Loans	Bank Reserves	Demand Deposits	Time Deposits	Reserves / Total Deposits (%)
1987	537	61	266	374	9.5
1988	477	198	254	301	35.7
Change	-60	+137	-12	-73	--

Source: Dominican Republic Central Bank
Note: All figures have been expressed in real terms by deflating nominal values by the GDP deflator.

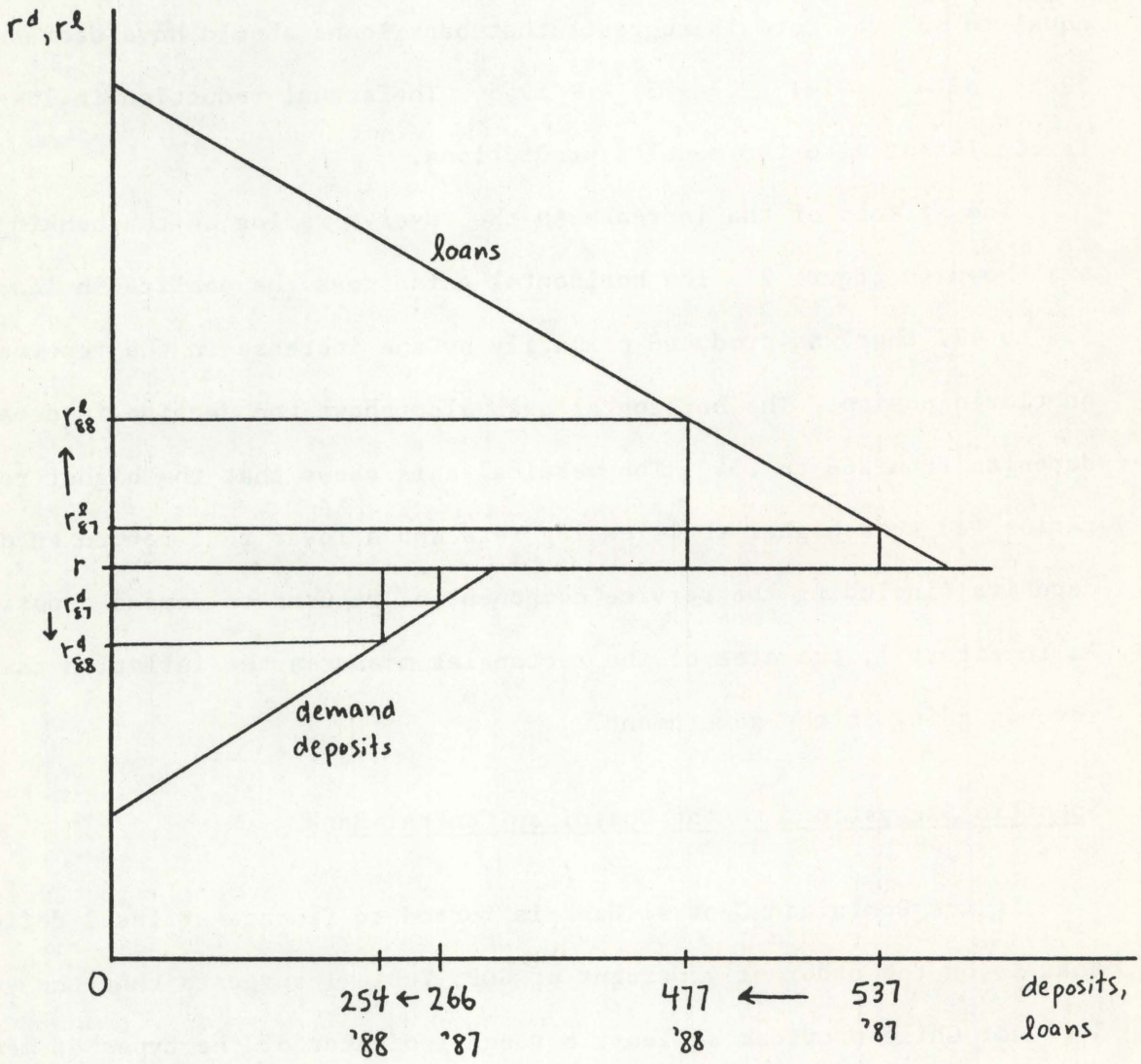
According to the model developed in "Central Bank Policy...", the change (Δ) in bank loans (ℓ) should approximately equal one minus the reserve ratio (τ) on demand deposits times the change in demand deposits plus one minus the reserve ratio (γ) on time deposits times the change in time deposits: $\Delta\ell = (1 - \tau)\Delta d + (1 - \gamma)\Delta t$. Setting the two reserve ratios equal to .3, the formula suggests that bank loans should have decreased by 59.5: $\Delta\ell = .7(-12) + .7(-73) = -59.5$. The actual reduction in loans of 60 is consistent with the model's predictions.

The effects of the increase in the reserve ratios on the banking system are shown in Figure 2. The horizontal axis shows the decline in loans from 537 to 477 that was produced primarily by the increase in the reserve ratio on time deposits. The horizontal axis also shows the decline in demand deposits from 266 to 254. The vertical axis shows that the higher reserve ratios led to a higher real lending rate and a lower real return on demand deposits (including the service component of returns on demand deposits). As in Figure 1, the area of the rectangles measures the inflation tax revenue going to the government.

Specific Suggestions to the Dominican Central Bank

If the Dominican Central Bank is forced to finance a fiscal deficit that is on the order of 4 percent of GDP, Table 1 suggests that the year 1977 for Chile provides at least a rough indicator of the types of measures that the Central Bank will have to take. In 1977, the legal reserve ratio on demand deposits was 70 percent, the legal reserve ratio on time deposits was 36 percent, required reserves on time deposits were paid about 85 percent of the market-clearing interest rate, and the rate of inflation was about 84 percent. Total inflation tax revenue was about 3.9 percent of GDP.

Figure 2. The Contraction of the Dominican Financial System Following the Increase in Reserve Requirements



The following are four specific suggestions, should the Central Bank be forced to finance a large fiscal deficit with the inflation tax:

(a) Pay interest on required reserves on time deposits. Such an action will lower the real lending rate in the banking system. Lower real lending rates will aid production and lower the rate of debtor defaults. Reducing the default rate is particularly important, since bank interventions by the Central Bank are very costly and imply an increased level of the inflation tax to finance the intervention.

(b) Aim at lower rates of inflation than the Chileans. The Chileans had effectively indexed their whole economy, including tax collections, to the price level. In the Dominican Republic, higher inflation will probably lower real tax revenue because of collection lags, thereby worsening the fiscal deficit. This advice means that reserve requirements may have to be raised to high levels, although not to levels that exceed the base-maximizing levels (see "Central Bank Policy..." for a discussion of this point).

(c) Deregulate the banking system carefully. Keeping interest rates at low levels robs the Central Bank of inflation tax revenue, since the low interest rates create rents that are transfered to the banks rather than to the Central Bank. Rather than allowing complete deregulation of interest rates, the Central Bank should attempt to maintain interest rates that are positive in real terms. Complete deregulation will probably increase the problem of moral hazard in the banking system, where marginal banks pay high rates of interest and invest in overly risky projects.

(d) In the long run revenue from the inflation tax is equal to $(\pi + r)h$, where $h = c + \tau d + \gamma t$ is the monetary base. In the short run, however, revenue from the inflation tax is $h\pi + \dot{h}$. Between December 1987

and December 1988 the Dominican Central Bank raised the real size of the monetary base by 48 percent (equal to the rate of growth of 103 percent of the nominal base minus the rate of inflation of 55 percent). This increase was accomplished by raising the effective reserve ratio on bank deposits, since currency fell by 8 percent in real terms during this period while bank reserves rose by 58 percent in real terms. Assuming that the monetary base is roughly 8.5 percent of GDP, the 48 percent increase in the real size of the monetary base was equivalent to about 4.2 percent of GDP.

Such increases in the size of the base ($\dot{h} > 0$) can only be useful as one-time revenue-raising measures. The Dominican Central Bank could engineer another one-time increase in the base by lengthening the time that the Central Bank holds prior import deposits (depósitos previos). In that way, the stock of prior import deposits held at the Central bank would rise, thereby leading to a one-time ability to finance part of a fiscal deficit without causing a large increase in the inflation rate.

Table 3 (taken from P. Brock, "Inflationary Finance in an Open Economy," Journal of Monetary Economics 1984) shows the use of prior import deposits by ten countries during the 1970s. The size of prior import deposits relative to the monetary base rose to high levels in several countries, frequently reaching 25 percent of the monetary base.

As in the case of the imposition of reserve requirements, reliance on prior import deposits as a source of finance creates important distortions in the functioning of the economy. Both reserve requirements and prior import deposits should be avoided unless the Central Bank has no other alternative ways of managing the financing of the fiscal deficit.

Table 3

Prior import deposits (as a percentage of monetary base).[a]

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Brazil	3.7	4.9	5.5	5.0	8.0	25.5	19.9	20.3	15.3	4.3
Colombia	12.2	11.7	12.9	11.3	5.0	1.7	6.4	4.9	6.4	6.2
Ecuador	11.9	15.1	0.2	0.1	6.3	13.1	12.5	9.6	8.9	9.9
Paraguay	3.1	2.3	2.9	2.9	2.1	2.4	3.0	3.6	3.8	2.9
Uruguay	16.5	22.9	21.4	24.0	7.6	0.6	0.1	—	—	—
Burundi	5.7	10.3	10.8	10.1	8.1	9.0	7.9	9.8	6.9	7.8
Ghana	27.2	35.5	25.2	17.6	14.6	10.8	11.5	11.7	12.9	7.4
Iran	8.1	12.4	15.8	30.8	24.2	17.7	17.0	n.a.	10.1	9.9
Korea	0.5	1.9	2.8	7.6	16.7	15.3	8.4	3.7	4.8	10.5
Zaire	3.5	3.2	3.3	13.8	6.3	6.8	23.9	27.8	38.2	17.7

[a]*Source*: *International Financial Statistics*, various issues.

The monetary base equals reserve money plus prior import deposits (lines 14 plus 16b).

2. Exchange Rate Policy

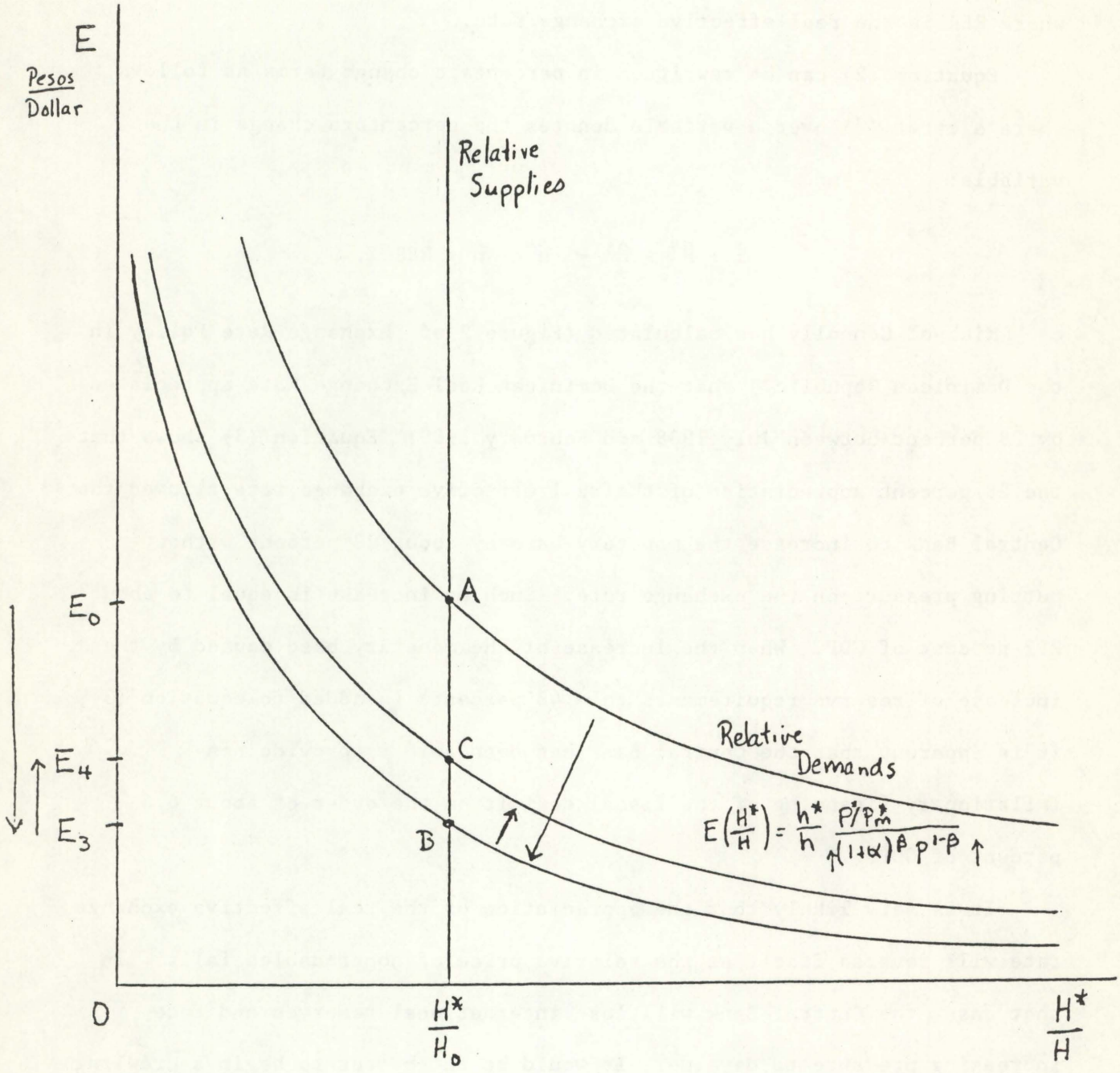
If the Central Bank does have to finance a large fiscal deficit, a fixed exchange rate policy will not be credible or sustainable. The Central Bank should maintain exchange controls and adopt a crawling peg exchange rate regime that is consistent with the rate of domestic credit creation.

The Central Bank probably has been able to maintain a fixed exchange rate since July 1988 because of several factors. First, the rise in reserve ratios has allowed the Central Bank to finance the deficit without creating upward pressure on the exchange rate. Second, the rise in tariffs or tariff equivalents has raised the price of importables and probably has raised the relative price of nontradables (see the discussion in "Central Bank Policy..."). The favorable agreement with Falconbridge has improved the country's terms of trade and put upward pressure on the relative price of nontradables. So too has the government's public works program.

Figure 3 is taken from my accompanying paper ("Central Bank Policy..."). Figure 3 shows that the higher tariff as well as other forces that raise the relative price of nontradables cause the exchange rate to appreciate under a floating rate system from E_0 to E_3. Under a fixed rate system a higher tariff and rising relative price of nontradables causes an inflow of international reserves. Under a floating rate system, the exchange rate overshoots as a result of an initial expansion of nontraded investment that declines over time. After the initial overshooting, the exchange rate depreciates from E_3 to E_4. Under a fixed exchange rate, the pressures for depreciation produce a decline in international reserves.

The market clearing equation for the exchange rate is the following (see Figure 3 and the paper "Central Bank Policy..."):

Figure 3. Exchange Rate Overshooting Following an Increase in the Tariff (α), an Improvement in the Terms of Trade (θ), Increased Transfers from the Rest of the World (Z), and an Expansion of Nontraded Government Purchases (G^n)



$$E\left(\frac{H^*}{H}\right) = \frac{h^*}{h} \cdot \frac{P^*/P^{m*}}{(1+\alpha)^{\beta} p^{1-\beta}} = \frac{h^*}{h} \cdot RER \ , \qquad (2)$$

where RER is the real effective exchange rate.

Equation (2) can be rewritten in percentage change terms as follows, where a caret (^) over a variable denotes the percentage change in that variable:

$$\hat{E} + \hat{H}^* - \hat{H} = \hat{h}^* - \hat{h} + R\hat{E}R \ . \qquad (3)$$

Michael Connolly has calculated (Figure 2 of "Exchange Rate Policy in the Dominican Republic") that the Dominican Real Exchange Rate appreciated by 28 percent between July 1988 and February 1989. Equation (3) shows that the 28 percent appreciation of the real effective exchange rate allowed the Central Bank to increase the monetary base by about 28 percent without putting pressure on the exchange rate. Such an increase is equal to about 2.2 percent of GDP. When the increase of the monetary base caused by the increase of reserve requirements ($\hat{h}$ = 48 percent) is added to equation (3), it is apparent that the Central Bank has been able to provide non-inflationary financing of the fiscal deficit on the order of about 6.6 percent of GDP.

It is very likely that the appreciation of the real effective exchange rate will reverse itself as the relative price of nontradables falls. In that case, the Central Bank will lose international reserves and face increasing pressure to devalue. It would be far better to begin a crawling peg exchange rate regime while the Central Bank has reserves and to plan for a real devaluation (an increase in the real effective exchange rate) over the next year. There are many role models for the Dominican Central Bank to follow. My favorite is the system used by Colombia since 1967.

3. Consequences for the Financial System

Imposing a large inflation tax could potentially cause much damage to the financial system. It would be wise to pay positive real interest rates on time deposits, but not to liberalize the entire financial system.

If granted the authority, the Central Bank should try to bring the parallel financial market into the formal system. There are two reasons for doing this. First, by formalizing the parallel market the Central Bank will be in a better position to impose the inflation tax on the parallel market, thereby broadening the base for the inflation tax. Second, when institutions fail in the parallel market, they will likely receive aid from the Central Bank. This aid expands the stock of domestic credit and adds to the inflation tax that the Central Bank has to levy. By placing the institutions of the parallel market under Central Bank control, the Central Bank will have a better opportunity of enforcing standards of prudent conduct that lower the chances of large-scale bankruptcy in the parallel market.

4. Conclusion

All of the measures described in this paper are designed to make the best of a bad situation. It is clear that fiscal finances need to be reformed in order to allow the Central Bank to perform its traditional role in the Dominican economy without having to finance large fiscal deficits.